

FCT-650: Light I-V Testing for Solar Cells



The removable chuck plate allows for multiple backside contact chucks to be rapidly interchanged with the standard front contact chuck.

Advanced analysis of solar cells including light I-V and Suns-Voc data. Capability to accurately measure high-efficiency conventional or backside-contact solar cells.

Product Overview

The FCT-650 has been designed to have the highest possible accuracy for measuring high-efficiency solar cells. This is done using patented Voltage Modulation to neutralize the capacitive effects in I-V measurements. The FCT-650 offers high-resolution, high-speed data acquisition with simultaneous I-V-illumination sampling.

The Sinton analysis package includes standard cell test outputs. It is supplemented with the Suns-Voc analysis that precisely indicates the source of power loss with accurate shunt and series resistance measurements.

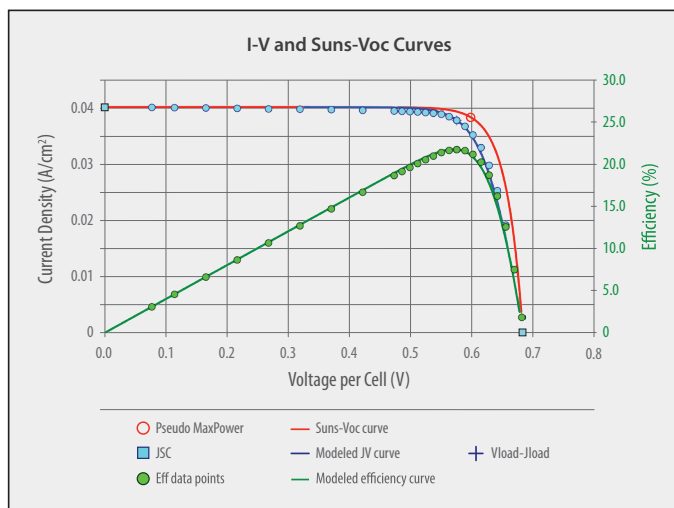
System Capabilities & Analysis Techniques

Primary application:

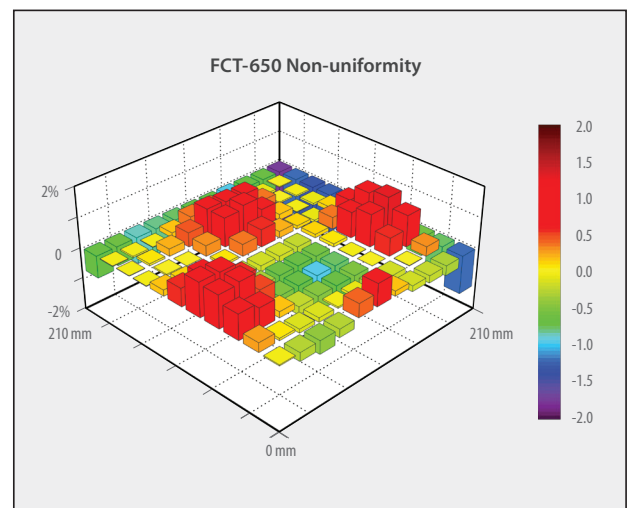
- One-sun cell flash testing

Analysis techniques:

- Suns-Voc curve
- 5-point testing utilizing Suns-Voc, J_{sc} , V_{mp}
- MultiSuns analysis (I-V curves at multiple intensities)
- Efficiency vs. intensity characteristic
- Power loss analysis
- Substrate doping measurement



The instrument interface displays both I-V and Suns-Voc data. This permits quick identification of shunt and series resistance effects.



The non-uniformity of the FCT-650 is Class A ($\pm 2\%$) over 210 mm x 210 mm.

FCT-650 Specifications

Instrument Specifications

Available measurements

- Voc, Isc, Vmp, Imp, FF, Rs, Rsh (dark Rsh)
- Suns-Voc parameters
- J_0 , bulk lifetime, lifetime at max power
- Forward and reverse dark I-V
- Substrate doping
- Current biasing for optional EL

Measurement modes

- Full I-V
- 3-point measurement (Voc, Isc, Vload)
- Hunt for Vmp (optimized sequence to take data at Vmp)
- Isc only

Current: 20 A

Voltage: 2.5 V (default), 10 V (optional)

Available temperature range

- 15 –60°C @ 25°C ambient

Available chuck designs

- Standard 6-busbar, front-contact chuck
- Up to 18 busbars available
- Custom back-contact chucks
- R&D front-contact chuck accommodating cell sizes 2 mm x 2 mm to 210 mm x 210 mm

Available intensity range

- 0.2–1.2 suns

Non-uniformity

- $\pm 2\%$ 210 x 210 mm

Simulator class

- Class A non-uniformity over 210 x 210 mm
- Class A temporal stability
- Class A spectrum

Warranty

- 1-year limited warranty on all parts and software



Facility Requirements

Ambient operating temperature

- 20°C–25°C

Power requirements

- Instrument: 80 W
- Computer with monitor: 200 W
- Light source: 60 W
- Vacuum: 370 W

Dimensions (L x W x H)

- Base: 70 x 66 x 91 cm
- Flash engine: 38 x 38 x 61 cm
- Fully assembled: 70 x 66 x 155 cm

Universal mains voltage

- 100–240 VAC 50/60 Hz

Special facilities requirements

- Vacuum: 4.8 cfm, 29.5 in-Hg



High-throughput flash power supply and electronic load box.



FCT Components

- Electronic load and current, voltage interconnections
- Programmable flashlamp and supply
- Windows PC with installed, configured software and monitor
- Sinton Instruments data acquisition and analysis software package
- Temperature-controlled chuck capable of measuring up to 12 busbars
- Optional vacuum pump optimized for use with the FCT-650

Purchasing Information

For a quote, please contact quotes@sintoninstruments.com

We are happy to accommodate custom requirements. Please inquire about a quote for your specific needs. Quotes are valid for 60 days.

For our full product line, visit our website at: www.sintoninstruments.com